AFNI Jazzercise Hints

Below are some hints that should help you answer the AFNI Jazzercise Questions.

1. See examples of input sub-brick selection in **3dbucket –help**, and consider the –prefix option.

2. Use program **`3dMean`**. Check out the **3dMean –help** menu for further assistance.

3. The **–help** menus for **`3dIntracranial`** and **`3dSkullStrip`** will help you type the correct commands. To best way to view the 2 output files simultaneously is to open two separate AFNI viewers. The 3dIntracranial program will work best with minimum and maximum limits set to 500 and 2000, respectively.

4. Creating and Playing with ROI Masks:
   a. Use **`3dinfo`** (or the AFNI GUI) to find out that sub-bricks 2 and 4 have the desired t-statistic values we need to answer this question. In **`3dcalc`**, use the '**ispositive'** function to create a mask for values where "(a-4.2) > 0", say. Multiply those mask values by the same expression for dataset 'b'.

   b. Note that 3 = 1 + 2. Add mask 'a' plus two times mask 'b'.

   c. In AFNI, set **`PN_mask_4+orig`** as the overlay. Display only 4 positive color ranges.

   d. Use **`PN_mask+orig`** as the mask, and apply the **–quiet** option. Redirect the output to **PN_mean.1D**.

5. Fun with 1D files:
   a. First, run the AFNI program **`count`** to create 3 rows of these numbers. Second, run the AFNI program **`1dtranspose`** to convert each of these 3 rows to a column.

   b. Now combine the 3 columns into one column with the AFNI program **`1dcat`**.

   c. See **1dcat –help** for assistance in combining separate 1D files into one big 1D file.

   d. Do arithmetic on the 1D files with AFNI program **1deval**. See **1deval –help** for further assistance.

6. Fun with the AFNI GUI
   a. If you right-click on the gray-scale bar of any viewing plane (e.g.,, sagittal), you will find a hidden pop-up menu with several options. One of those options can be used to answer this question.

   b. All of the answers can be found in the Define OverLay control panel in the AFNI GUI. Hunt around for hidden popup menus by left-clicking in the color bar. Also place your cursor over the color bar panels to see what appears.

   c. The answer can be found in one of the buttons located at the bottom of the sagittal viewing plane (e.g., Disp, Sav1.ppm, Mont, etc…)

   d. Remember what we learned in the Talairach hands-on? Right-click in an image window.

e. The answer can be found in one of the buttons located at the bottom of the sagittal viewing plane (e.g., Disp, Sav1.ppm, Mont, etc…)

f. Right- and Left-click anywhere you can in the afni GUI in search of this hidden Mission Statement. There is one particularly large open space.

7. Doing Calculations in AFNI:
   a. Use **`3dinfo`** to find information about a dataset.

   b. **`ccalc`** is a simple calculator program in AFNI.

8. Image Filtering:
   a. The AFNI program **`3dmerge`** can be used for a variety of tasks, including smoothing. For this question, the Gaussian filter may be a good choice.

   b. The AFNI program **`3dLocalstat`** looks in "neighborhoods" around each voxel. To get it to use voxels units for the neighborhood instead of mm, use a negative number.

   c. The AFNI program **`3danisosmooth`** sharpens edges and smoothes images. It usually shows 10 iterations (default), but that may be too much for this example. Use the **–viewer** option to pick something lower and try it again with the new option.

9. Random Exercises with AFNI Datasets:
   a. First, use **`3dinfo`** to determine the xyz-orientation of the dataset. Then run **`3dresample`** or **`3daxialize`** to re-orient the dataset.

   b. Use **`3dbucket`** or 3dcalc to create 2 separate datasets from **`func_slim+orig`**. Remember that in AFNI, sub-bricks begin at 0, not 1.

   c. Program **`3dbucket`** can also be used to combine datasets together.

   d. The AFNI program **adwarp** can be used to transfer the Talairach transformation of an anatomical dataset to a "follower" dataset like **`func_slim+orig`**. Pay special attention to the **–dxyz** option available in **adwarp** (see **adwarp –help**).

   e. Find the maximum voxels with **`3dmaxima`** and use **`whereami`** to find the atlas position of the maximum voxel.

   f. Use program **`3dZcutup`**. This program cuts up volumes in the z-direction. Check out the **3dZcutup –help** menu for further assistance.